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PLANNING INDUSTRIAL PRODUCTION IN THE USSR

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Stages in Planning

Preparation of a plan begins with a survey of the plan fulfillment for the preceding year. This is somewhat complicated by the fact that the preparation of a plan must be completed before the actual results of the preceding year's plan are known. To overcome this difficulty, Gosplan, in collaboration with the ministries which directly control the enterprises, determines the extent to which the current plan has already been fulfilled and estimates the probably course of plan fulfillment for the remainder of the year. Experience has shown that these preliminary figures differ only slightly from the data reported at the completion of the period.

On the basis of these preliminary figures, estimates are made of the following: the level of industrial development attained, the volume of production, labor productivity, costs, capital construction, and the stages of completion of new construction at the end of the accounting period. An analysis is also made of the reasons nonfulfilling or exceeding the plan. The estimates also contain figures on plan fulfillment by regions, evaluation of the efforts to bring about a better distribution of industry, data on the financial plan, working capital, credit plan, and reserves of enterprises.

The party and the government shape the general outlines of the plan and correlate its various parts in conformity with the general political and economic tasks which confront the country. They determine the over-all growth of industrial production, the relationship between consumption and accumulation, the proportion of capital goods to consumption goods, the geographical distribution of industry, and the initiation of large construction programs.

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Technological policy occupies an important place in planning. Training of engineers, for example, requires long-range planning and is based on decisions of technological policy.

After the principal political and economic tasks have been formulated and the principles of technological policy established, Gosplan proceeds with the preparation of a number of general economic balance sheets, such as the balance sheet of capital investment and available resources, the balance sheet of the monetary income and expenditures of the population, and the balance sheet of the labor force.

Balance sheets of industrial production generally fall into three groups: those of (1) industrial commodities intended for the replacement and expansion of the fixed capital of the country, (2) industrial commodities which go into current assets, and (3) commodities intended for consumption by the population.

The balance sheets are uniform for all types of production as follows:

Requirements	Resources
Production and operating needs	Yearly production
Capital construction	Stocks carried over from preceding year
Consumer requirements	
State reserves	
Stocks to be carried over to the following year	
Exports	
Others	

Separate requirements and resource figures are established for each ministry, branch of industry, and union republic. The work of compiling balance sheets of materials used in production is carried on by Gosplan in close collaboration with the ministries and their main administrations and also with the largest enterprises. The draft plan is then examined and ratified by the government. The composite plan of industrial production prepared by Gosplan embraces all branches and enterprises of the country and is not simply the summation of branch and departmental plans. With the ratification of the production plans of the ministries and of the composite plan by the Council of Ministers USSR, they become state law.

In addition to the yearly plan, there are quarterly breakdowns which, like the yearly plan, are prepared on the basis of balance sheets of materials used in production.

The ministries and departments also establish monthly plans for the enterprises under their jurisdiction. The ministries are permitted to raise the monthly production targets which they assign to their enterprises, but not more than 10 percent over the state plan.

When a product is manufactured in only one factory, the production program of that enterprise is usually established directly by the national economic plan. Generally, however, the production plans of individual enterprises are determined by the appropriate main administration (glavk) or ministry.

In the preparation of the production program of an enterprise it is necessary to consider the following factors: (1) the productive capacity of the enterprise, (2) the condition of its production machinery, (3) the main centers where the enterprise's products are used, as well as the centers where raw materials and fuel used by the enterprise originate, (4) the necessity of mobilizing all productive resources of a branch, and (5) the necessity of fixing a definite production assortment at a given enterprise and thus avoid frequent retooling.

Industrial Production Program

The industrial production program can be formulated only as a component part of a unified national-economic plan. Therefore, the plan for industrial production must be based on the interrelationships existing between industry and other branches of the national economy. At the same time consideration must be given to interrelationships obtaining between various branches of industry. The volume of output in any branch of industry must correspond to the country's requirements in the products of that branch of industry. It follows from this that the establishment of adequate relationships in the development of individual branches of industry is the most important task in planning industrial production.

Adequate relationships in the development of individual branches of industry do not imply a uniform rate of growth in every branch of production. These rates of growth will differ in various branches of industry and will vary from the rates of growth of industry as a whole. Thus, the rate of growth of steel and rolled products may be lower than that of the machine-building industry if output of the latter is devoted more to precision machinery than to metal-consuming machinery. However, the rates of growth in all branches of industry must be such as to insure the solution of the basic economic task confronting the country during the period covered by the plan.

In developing a program of industrial production it is necessary to take as a starting point the production targets of the most important branches of industry. These are determined in accordance with the basic political and economic tasks facing the country at a particular time. During the postwar Five-Year Plan, for example, the necessity of reestablishing the national economy in the shortest possible time requires a rapid development of the metallurgical machine-building and construction industries. High priority must also be given to the expansion of the power and fuel industries, particularly of coal and petroleum.

Another problem which looms large in the postwar Five-Year Plan is that of raising the technological level of industry. Reconstruction of the national economy does not mean the reestablishment of the prewar technology. On the contrary, it requires removal of all technological defects existing before the war and the introduction of technological improvements and innovations which will make the technological level of USSR industry superior to that of the principal capitalist countries.

Raising the technological level of production is important for strengthening the country's defensive power, and is an important prerequisite for raising the productivity of labor. Freezing workers to their jobs, especially in the coal, peat, lumber, and construction industries, will be successfully accomplished only when these industries are sufficiently mechanized to make work in them easier.

The present technological level of USSR industry and its production capacity make it possible to carry on experimental work for testing new technical inventions and undertaking needed construction. The main technological problems facing the country today, namely, the utilization of atomic energy, radar, and jet-propelled engines, can be successfully solved only if the country's industry has large raw material reserves, well-developed metallurgical, machine-building and chemical industries, and highly qualified scientists and designers. USSR industry has all these prerequisites.

The postwar Five-Year Plan sets forth the following lines of technological improvements: (1) ferrous metallurgy -- mechanizing operations in blast furnaces, open-hearth furnaces and rolling mills, equipping intershop and mine transport with self-unloading cars, installing cranes in ore dumps of

metallurgical and coke-chemical plants, extensive use of heat dressing of metals, large-scale utilization of the oxygen blast in blast furnaces and steel smelting plants, and equipping metallurgical units with checking and measuring instruments and devices for automatic control; (2) machine building -- introduction of assembly and automatic conveyer lines and combination machine tools, die-casting and chill-casting, automatic welding, the introduction of forming and welding designs, hardening by high-frequency currents, electric heat treatment, forming by high-speed stamping, and superspeed milling. Each branch of industry must have a technical plan which provides for the following: the method and the time of transfer to continuous production, mechanization of production and inspection, selection of types of machinery and equipment, types of raw material, and methods and rates of its utilization.

In formulating its production plan each branch of industry must take into account the following factors:

1. How much of its product is required by the national economy.

2. What the production capacity of the industry is and the extent to which it can be utilized.

3. How much raw material, fuel, and other materials will be required in the production program and to what extent the national economy can meet these requirements.

4. The number of workers required to carry out the program.

5. The quantity and composition of its output.

Determining the Requirements of the National Economy

National economic requirements are classified into the following categories: production, personal consumption, stocks, reserves, and export. Computation of national economic requirements for a given product goes beyond the process of mere mechanical addition of what each branch of industry requires. Consideration must also be given to the following factors:

1. The role which the branch of industry plays in the economy of the country and in increasing its military potential.

2. The policy of economical use of raw materials and fuel and of utilizing substitute materials in place of those in short supply.

3. The geographical location of the branch of industry and the possibility of utilizing local resources.

In determining the requirements of the national economy priority is given to the needs of the most important branches of industry -- metallurgy, machine-building, fuel, power, and chemical.

The standards for determining production requirements are the scientifically computed progressive norms which take into consideration the experience of the most advanced technology and the achievements of best Stakhanovites and leading enterprises. The government fixes mean progressive norms for every branch of industry. These norms are higher than the mean arithmetic norms already attained in a given branch of industry, but somewhat lower than the norms in use by leading enterprises.

National economic requirements are determined on the basis of statements of requirements submitted by ministries and other government departments. These statements are entered into the balance sheet of production, on the basis of which the distribution plan is drawn up. Statements of ministries and other departments are carefully checked to make sure that the experience of leading enterprises in the economical use of raw material, fuel, and other materials has been taken into account and that the statements of requirements do not call for materials in excess of actual needs.

Another category of national economic requirements is that relating to stocks. The stocks of raw material, fuel, and other materials will vary with different branches of industry and different enterprises. However, in each case there must be enough of these stocks to insure the uninterrupted functioning of enterprises. At the same time the size of stocks will be influenced by seasonal variations in the procurement of raw materials and fuel and by transportation facilities existing between the consumer and producer.

Internal stocks are entered in the balance sheet of requirements only when it is deemed necessary to increase these stocks, in which case the ministry or department must present a statement supporting the required increase.

When increasing the enterprise's stocks, the following must be taken into consideration: the supply position at the beginning of the period for which the plan is made; the planned production program; the projected changes in the system of supply (affecting transit or storage) or changes in seasonal procurement; the possibility of replacing certain types of raw materials, fuel, and materials with other types; and the time needed to accomplish this

The determination of reserves is considerably more complicated. State reserves, like plant stocks, are necessary elements of the production process. The size of state reserves of a certain type of industrial product or raw material is determined by the importance of the product or of the raw material to the economy and to the security of the country; by the possibility of rapid expansion of the manufacture of that commodity in case of necessity (reserve production capacity, the existence of technological and economic conditions necessary for the utilization of this capacity, and the accessibility of explored geological resources); and by the location of production and marketing centers and the transportation facilities connecting these centers.

In any case state reserves must be adequate to meet any emergency (war, catastrophes caused by nature, etc.) and insure the systematic and uninterrupted functioning of the national economy. State reserves must also be established so that even if one branch of industry lags behind, the national economy as a whole can still fulfill the plan. Similarly, when a branch of industry exceeds its plan, state reserves must be sufficient to meet the increased requirements of that branch and the increased requirements of related branches.

Sufficient reserves are also of great importance to prevent slackening production during winter months. In numerous enterprises insufficient reserves, particularly in fuel, metal, and raw materials, have repeatedly resulted in seasonal reduction in production during winter months, when difficulties in transporting raw material and fuel occur.

In regard to foreign trade, the achievement of economic sovereignty and independence by the Soviet Union does not mean the curtailment of foreign trade. The expansion of economic relations between the USSR and other countries, in addition to being of great importance for strengthening political ties, also accelerates the rate of growth of the national economy. Of particular importance are the economic relations with the new democracies.

The volume of exports is determined in conformity with the terms of trade agreements concluded by the Soviet Union and with the government-approved plans of the Ministry of Foreign Trade.

Calculating Production Capacity

The next stage in planning the production program is the calculation of production capacity. Its purpose is to determine whether available resources in the national economy can meet the requirements of that economy.

Production capacity is not merely a technological concept but, as shown by the Stakhanovite movement, also involves economic factors. The capacity of a steel-casting shop, for example, is determined not only by the size of the furnace but also by labor productivity.

An important aspect of the plan is the liquidation of breaks and "bottlenecks" in production. Of particular importance in this regard is the elimination of uneven production. Since production capacity is based on the performance of leading shops and branches of industry, bottlenecks cannot be taken into consideration in calculating the production program.

The yardstick of production capacity is either the established norm of equipment utilization or the performance of leading Stakhanovites.

Methods of calculating production capacity vary for different industries. However, certain considerations are common to all. First of all, it is necessary to take an accounting of all equipment currently in operation as well as of new equipment which is expected to enter into operation during the period for which the plan is made. The second step in calculating production capacity is the determination of the time equipment is in operation. In industries where equipment is operating continuously this will amount annually to 8,760 hours (365 x 24) less the time needed for repairs.

In some branches of industry these two factors alone determine productive capacity. Thus, the production capacity of electric power plants is the capacity of the turbines multiplied by the number of hours of operation during the year. However, in most branches of industry it is necessary to establish norms of equipment utilization (coefficients of utilization) before it is possible to determine production capacity.

In the case of a blast furnace, for example, the coefficient of utilization is the number of cubic meters of the furnace necessary for smelting one ton of pig iron. Production capacity is calculated as follows: if the coefficient of utilization is 0.9, the volume of the furnace is 900 cubic meters, and the period of operation is 330 days, the capacity is 1,000 tons per day (900 divided by 0.9) or 330,000 tons per year.

The norms of utilization must be increased from year to year depending on improvements in the technical condition of equipment, the quality of raw material used, and the experience of leading enterprises.

In branches of industry operating on a noncontinuous schedule the number of workdays is 306 a year. The number of workhours depends on the number of shifts in an enterprise. Before the war many enterprises increased the number of shifts to fulfill their production program. It was found, however, that the three-shift system was not the most efficient one, and as a result many enterprises transferred to two shifts in 1940 and 1941. During the war three shifts were introduced again, but in the postwar period the tendency is once more to reduce the number of shifts whereever possible.

The next stage in calculating production capacity is the determination of the productivity of equipment, which is measured by the quantity of production of a machine per unit of time. Productivity depends to a large extent on the condition of the machine and on the type and variety of commodity produced. Calculation of productivity of equipment is not based on the current levels of productivity, but rather on mean progressive norms in the determination of which the achievements of leading enterprises are taken into account.

Determining Requirements for Raw Material, Fuel and Other Materials

Selection of a particular raw material is influenced by a number of factors, the most important of which are: the availability or scarcity of a given type of raw material, the technological process of production, intended use of the finished product, and the location of production and consumption centers of raw materials. Whenever possible, scarce raw materials should be replaced by those in ampler supply. It is the duty of all enterprises to utilize all types of raw material. High-quality production does not necessarily require the use of high-grade raw material.

Of particular importance is the plan of fuel requirements. The large number of coal, lignite, and shale-oil deposits scattered throughout the country make it possible to supply numerous branches of industry with local fuel. The new Five-Year Plan provides that in 1950 fuel needed by electric power plants be supplied from local sources to the extent of 80 percent (compared to 65 percent in 1940). Small and medium-sized enterprises are particularly adapted to the utilization of local resources.

Calculation of requirements for raw materials, fuel, and other materials must be based on the established norms of their expenditure per unit of production, as well as on the production volume of the raw material itself. If, for example, the plan provides for the production of 15 million tons of iron and 17 million tons of steel, the requirement for iron ore will be determined according to the coefficient of expenditure of iron ore per ton of iron and steel (assuming an average of iron content in the ore and equal production methods). If the smelting of one ton of iron requires 1.9 tons of iron ore and the smelting of one ton of steel requires 0.12 ton of iron ore, the total requirement of iron ore will be 30,540,000 tons (15,000,000 x 1.9 + 17,000,000 x 0.12).

Or, if sugar production is planned at 3 million tons for the season, the sugar content of the beets is 15 percent, and the loss in refining and transporting the sugar is 3 percent, the total sugar beet requirements will be 20,600,000 tons or 206 million centners $\left(\frac{3{,}000{,}000 \times 100 \times 100}{15 \times 97}\right)$.

The above examples demonstrate how raw material requirements are determined (1) by the production program, (2) the quality of the raw material, and (3) the technological process.

Not all branches of industry have equal priority for raw materials. First priority is given to defense, fuel, machine-building, chemical, and metallurgical industries. Regions which are being industrialized have also high priority. Thus the extent to which the requirements of a branch of industry in raw materials, fuels, and other materials are satisfied depends on the location and the relative importance of the branch of industry in the national economy of the country and the particular political and economic objectives which have been set for the period of the plan.

Determining Manpower Requirements

Manpower requirements are determined separately for each occupational group -- wage earners, junior auxiliary workers, engineering-technical workers, and salaried employees. Not until all plans for increasing production have been considered can the requirements of manpower be fully determined.

The growth of production is determined by the following factors:

1. Technical equipment of industry, which depends on the extent of capital construction.

2. The structure of wages, which is based on the socialist principle of payment according to quantity and quality of production. With the improvement in the technology of production output, norms are steadily revised upward, resulting in higher productivity.

3. Raising the skill of workers, which includes on-the-job training and preparing new qualified workers in FZO schools.

4. Organization of the production process. An even level of production and the extensive use of the mass production process, together with effective work discipline, are important factors in increasing labor productivity.

5. Rapid repair of machinery. Numerous enterprises of the USSR use a large number of workers for auxiliary and especially for repair work. A movement is on foot to train machine operators to make minor repairs themselves.

6. Socialist competion, of which the Stakhanovite movement is the most important.

The starting point in formulating a plan concerned with labor is the program for raising production. This program makes possible the determination of wages, which as a rule increase to a lesser extent than production, and of the number of new workers which the enlarged production program requires.

The following is an illustration of how manpower requirements are determined:

CURRENT YEAR

Branch of Industry	Gross Production (million rubles)	Output per Worker (rubles)	No of Workers
Machine-building	900	15,000	60,000
Ferrous metallurgy	200	8,000	25,000
Electric power plants	30	20,000	1,500
Construction material industry	300	5,000	60,000
Textile industry	500	10,000	50,000
Total	1,930	-	196,500

YEAR OF THE PLAN

Branch of Industry	Gross Production (million rubles)	Rate of Growth of Labor Productivity (%)	Output per Worker (rubles)	No of Workers
Machine-building	1,200	15	17,250	69,560
Ferrous metallurgy	250	12.5	9,000	27,770
Electric power plants	40	10	22,000	1,820
Construction material industry	420	20	6,000	70,000
Textile industry	600	10	11,000	54,545
Total	2,510	-	-	223,695

Enterprises calculate their requirements of skilled workers on the basis of their production program and the number of workhours necessary to fulfill that program. Operation charts are used for determining the necessary labor expenditure per unit and part.

The next stage in formulating the plan of labor is to determine the number of hours each worker is to put in during the year. This is arrived at by multiplying the number of workdays, which fluctuates between 265 and 273, by the average length of a workday.

The principal source of implementing industry's requirements of skilled labor are the graduates of FZO schools, who constitute the state labor reserve. This reserve is distributed among various industrial enterprises in accordance with government policy. By centralizing the preparation and assignment of skilled workers the interests of the most important enterprises and regions of the country can best be served. The establishment of the state labor reserve does not relieve industrial enterprises from training their own skilled workers. This is done by organizing Stakhanovite schools and by training unskilled workers for jobs requiring higher qualifications.

The number of engineers and technicians is determined on the basis of the established positions. During the postwar Five-Year Plan the number of engineers and technicians will increase relative to the total number of workers to conform to the general rise in the technological level of production.

Requirements for salaried employees are determined by the administrative structure and the table of organization. The former is frequently overcomplicated. The largest part of the salaried employees is engaged in accounting work. The number of salaried employees can be greatly reduced by simplifying the administrative structure and the accounting system.

In calculating manpower requirements it is necessary to take into account the number of workers who will leave during the period of the plan, (to go into the army, retire on a pension, etc.).

Manpower reserves for industry are to be found in the agricultural population, the city youth, and female labor. Women made up over half of the total number of workers and salaried employees by the end of the last war. In some industries women constitute the larger part of the labor force. In the textile industry, for example, women make up over 70 percent of the labor force; in the knitted fabric and sewing industry they exceed 80 percent. However, in some industries, like the metalworking industry and ferrous metallurgy, their proportion of the total labor force is smaller than that of males.

Determining the Output Plan

The output plan, which constitutes the final stage in the preparation of the production program, must be drawn up not only from the viewpoint of the available plant capacity, raw material, fuel, and manpower, but also from the standpoint of covering the requirements of the national economy as a whole and of eliminating existing imbalances.

The production plan of an enterprise includes an itemized list of the entire output of that enterprise, using both quantitative and monetary indexes. Branches of industry and ministries, on the other hand, include only indexes of output which fall within their respective specializations. All other production (outside services and output of auxiliary shops and FZO schools), with the exception of consumers' goods, is listed in the production plan only as a total expressed in monetary terms.

A major task confronting the planning organizations in the preparation of the production plan is to make sure that there is a proper correlation between quantitative and monetary indexes.

Of even greater importance is the determination of the assortments of production. On it depends the estimate of the production capacity of an enterprise. In determining the assortment of production many factors must be taken into consideration. The income of the population and the growth of its cultural level have an important bearing on the particular choice of assortment. The climate of the northern regions, for example, will necessitate a larger production of warm cloth compared to other types of cloth. Seasonal changes must also be taken into consideration in the quarterly plans of production; also, the taste of the consumers plays an important part. Trading organizations have an important role to play in this work since they are best acquainted with the regional demand of the population.

In ferrous metallurgy the needs of the national economy are the primary considerations. In 1947, for example, the emphasis was on the production of thin sheets for automobile production, electrical and boiler plate, ball bearings of the forged type, and large ball bearings.

Production programs of main administrations and enterprises must be checked to determine the quantity of new production provided for in the plan and its proportion of the total output. New products are especially important in the machine-building industry, since this industry greatly affects the technological level of all the other branches of the national economy. Planning organizations should be supplied with current issues of catalogues listing new products, especially catalogues of foreign firms.

Indexes of Industrial Production

The economic tasks which confront industry during the period for which the plan is made are reflected in a system of indexes. These indexes can be classified into (1) indexes of the volume of industrial production, (2) technical-economic indexes, and (3) qualitative indexes (productivity of labor and cost of production).

These indexes are interdependent and determine the production process only in their totality.

1. Indexes of the Volume of Industrial Production

The plan of industrial production is expressed in monetary and quantitative terms. The monetary value of production is calculated in fixed prices and in prices of the current year. Fixed prices are based on 1926/27 prices. Industrial cooperatives, however, use 1932 prices as the base.

In the case of new commodities, not in production in the base year, fixed prices are established on the basis of planned or estimated costs of the product when it went into mass production, corrected in accordance with the price index of that year. These prices must in every case be approved by a special committee of the Central Statistical Administration of Gosplan USSR.

Fixed prices serve the following purposes: (1) comparison of the physical volume of production during the year of the plan and that of the preceding year, (2) comparison of the volume of production of two branches of industry, and (3) determination of the growth of labor productivity.

It is necessary to call attention to the tentative character of "fixed prices." The amount of new production undertaken since 1926/27, especially in

the machine-building industry, is exceptionally large and the prices of the new products are calculated on the basis of estimated costs prevailing during the time when the product is turned out. Even after the correction coefficient is applied these prices generally turn out to be close to current prices.

It is necessary also to bear in mind that in the case of commodities produced in 1926/27, the fixed prices of that year do not reflect their production cost in subsequent years. As a result of technological improvements, the production cost of a number of goods have decreased several times since 1926/27, and factory prices have changed accordingly. This difference between actual costs and fixed prices led to the appearance in almost every enterprise of "profitable" and "unprofitable" production.

The proposal to replace the fixed prices of 1926/27 by those of 1940 or some other year cannot be accepted, as in the course of a few years the new fixed prices will develop the same defects as are found in the 1926/27 fixed prices. The best solution of the problem of measuring changes in the physical volume of production consists in the formulation of indexes of industrial production. A change of the index, based on data concerning the specific share of individual branches of industry and the rates of their growth, would indicate the physical volume of production. The rates of growth of individual branches of industry should be determined on the basis of their production increase calculated in current prices and corrected by price-fluctuation factors. The complexity of the problem lies in the necessity of determining the specific share of individual branches of industry in the base year. The fixed prices of 1926/27 are not adequate for this purpose since, as has been shown above, the specific share of a branch of industry, computed in terms of these prices, fails to give a correct picture of the distribution of production between various branches of industry.

Planned production is calculated in current factory prices. In branches of industry where there are no uniform lists of factory prices (textile, food, meat, fish, and light industries) production is calculated according to retail price lists, minus deductions made in favor of trade organizations. In branches of industry where the retail or factory prices vary according to zones, production is calculated in settlement prices, which are the result of direct settlement between marketing organizations and producers. The need for computing settlement prices is explained by the fact that for a number of products the government fixes factory prices irrespective of production costs. Since production costs differ with various enterprises it becomes necessary to protect some producers from suffering losses and prevent others from making excess profits. The marketing organization, therefore, pays the enterprise in "settlement prices," calculated on the basis of planned costs of the enterprise. The consumer, however, gets the goods in fixed factory prices.

Factory and list prices are calculated on the basis of planned costs, i.e., planned expenditures for production and profits. The latter consists of two elements: earnings and turnover tax. From an economic standpoint earnings and the turnover tax have the same character in that both represent the surplus product or part of labor expenditure which goes to the state.

Inasmuch as current prices are based on actual labor expenditure, production calculated in current prices is most accurate in determining the actual economic relations between various branches of industry. Computation of production in current prices makes possible the determination of the volume of trade turnover, costs, earnings, turnover tax, turnover capital, etc. Therefore, just as calculation of production in fixed prices is necessary for comparing changes in the quantitative volume of production, so calculation of production in current factory prices is essential in operational planning.

Commodity production, the most important index of the production plan, is calculated in current factory prices. Until 1940 the government approved only the gross production plan. Beginning with 1941 the government approves the plan of commodity production for all branches of industry.

Commodity production includes the following: (1) finished products, (2) mass-consumption good manufactured either from new raw material or from waste products, (3) services of a productive nature supplied to outsiders, such as electric power, steam, water, and production of secondary and auxiliary shops, but not the services of factory transport, (4) assembly work for outsiders, if performed by workers of the enterprise and not included in the factory price of a product, (5) production and services of the enterprise for its own capital construction, public utilities, and the improvement of cultural and living conditions of its workers, (6) semimanufactures produced for sale to outsiders, (7) products of FZO schools sold to outsiders, and (8) packing material produced by the enterprise, if not included in the factory price of a commodity.

If raw material is supplied by the customer, the production cost includes only the cost of manufacturing.

Gross production for a certain period includes commodity production plus or minus the stocks of unfinished production at the beginning and at the end of the accounting period. In other words, gross production shows the complete operation of an enterprise.

The task of planners in making up the production program is to reduce the gap between commodity and gross production. The extent of this gap is determined by the amount of unfinished production. In several branches of industry the production cycle does not coincide with the yearly period, as, for instance, in viniculture, where the quality of the wine depends on the length of aging and is therefore included in the production cycle.

In some branches of industry, notably machine-building, the percentage of unfinished production is very high, resulting in the freezing of materials and funds. Lowering the proportion of unfinished products is an important step toward shortening the production cycle.

Quantitative indexes are the principal indexes for measuring the production program. Monetary indexes are valuable for measuring the rate of growth of an industry or its share in the total industrial production; but for measuring the quantity of production and for determining the relationship between resources and requirements, quantitative indexes are used (tons, units, kilowatt-hours, etc). Fixing of quantitative indexes is the first step in the preparation of a production plan, which is then restated in monetary indexes.

Of the many types of commodities manufactured by industry, only the most important products are included in the national economic plan. Some of the products are broken down according to type, grade, capacity, etc. The extent of the classification breakdown depends on the importance of the branch of industry to the economy of the country.

2. Technical-Economic Indexes

Closely related to indexes of volume of production are the technical-economic indexes, which reflect the concern of the party and the government about developing the most up-to-date technology in USSR industry. The most important of these indexes are the following:

a. Indexes of the most up-to-date equipment and technological processes used in industry, as, for example, the percentage of turbine drills used in the extracting of petroleum.

b. Indexes of equipment utilization. These indexes refer to the number of hours which a power plant operates, the coefficient of utilization of a blast furnace, etc. These indexes are determined on the basis of the technological level of the preceding year, the volume and output structure of the machine building industry, machinery supply plans of individual branches of industry, and the extent of utilization of new equipment.

c. Indexes of the mechanization of labor processes. These indexes are closely related to the first two groups of indexes and are used to measure labor productivity. They are computed on the basis of the existing number of machines and the extent of their utilization.

d. Indexes of consumption of electric power, fuel, raw material, and other materials. The purpose of these indexes is to establish such standards for the utilization of fuel, raw material, and other materials as would insure their most economical use.

3. Qualitative Indexes

The most important qualitative indexes are the indexes of production quality, labor productivity, and production cost.

a. Index of Production Quality

This index refers to the metal content of ore, sulfur content of coke, etc.

b. Index of Labor Productivity

This index measures the output per worker or per employee (trudyashchiysya). The latter covers the total number of those occupied in a branch of industry or an enterprise, including workers, office personnel, engineering-technical personnel, and junior assistants. The growth of output per employee will be higher than that per worker because the number of office personnel grows more slowly than the number of workers.

The output per worker or employee is calculated in quantitative and monetary terms. However, the calculation in quantitative terms is more accurate in showing the real growth of output. When a change in the assortment takes place, resulting in a change of expendable labor, it is necessary to introduce a correction factor. The quantitative method of calculation is feasible only in enterprises and branches of industry which produce one kind of product (coal, pig iron, etc.). In enterprises and branches of industry which produce a variety of products, output per worker and employee is calculated in monetary terms.

Currently the rate of growth of labor productivity is calculated on the basis of gross production figures of 1926/27 and in fixed prices of that year. However, the task of determining the growth of labor productivity cannot be accomplished by dividing gross production by the number of workers (or employees) engaged in industry for reasons that this division does not take into account structural shifts in production. But the main difficulty lies in the fact that gross production per worker is not an index of labor productivity. The gross output per worker in a blast furnace, measured in monetary terms, will always be higher than in ore mining, for reasons that the cost of pig iron includes the cost of iron ore. Likewise, the gross output per worker in machine-building is higher than in ferrous metallurgy, because the cost of a machine includes the cost of metal.

On the other hand, in the light and food industries, where the relative cost of raw material is generally higher than in the branches of heavy

industry, gross production per worker will be higher than in branches which manufacture the means of production. Even if the extracting and heavy industries expand at a greater rate than the light industry, the average output per worker for industry as a whole may show a decrease, although the productivity of labor was increasing in every branch of industry.

To make this clear, let us suppose that in three branches of industry, A, B, and C, the gross production per worker amounts to 6,000, 10,000, and 18,000 rubles respectively. Output per worker during the period for which the plan is made is expected to increase by 10 percent; and the largest increase in production is to take place in branches A and B. The result will be as follows:

	CURRENT YEAR			YEAR OF THE PLAN		
Branch	No of Workers	Output (rubles)	Production (1,000 rubles)	No of Workers	Output (rubles)	Production (1,000 rubles)
A	1,000	6,000	6,000	3,000	6,600	19,800
B	2,000	10,000	20,000	3,000	11,000	33,000
C	5,000	18,000	90,000	6,000	19,800	118,800
Total	8,000		116,000	12,000		171,600

In the current year the average output per worker in the three branches of industry amounted to 14,500 rubles (116,000,000 ÷ 8,000). In the year of the plan that output fell to 14,300 rubles (171,600,000 ÷ 12,000), even though output per worker increased in all branches of industry by 10 percent. It follows, therefore, that this method of calculating productivity is unreliable.

The index method which takes into consideration the changes in the number of workers employed in various enterprises and branches of industry is the best method of measuring the increase of labor productivity in industry as a whole and in its various branches. The gist of this method is as follows: the rate of increase of productivity in each branch of industry is multiplied by the number of workers employed in that branch during the period of the plan; the total obtained for all branches of industry is divided by the total number of workers. In the above example the output during the period of the plan is 110 percent compared to that of the accounting period. Multiplying this rate by the number of workers (110 x 3,000) + (110 x 3,000) + (110 x 6,000) and dividing the sum by the total number of workers (12,000), we obtain a 10-percent increase in the productivity of labor.

c. Indexes of Production Costs

The principal elements of production cost are: wages, raw materials and basic materials, other materials, fuel and electric power, depreciation deductions, administrative and management expenditures, trade and marketing expenditures, and other expenditures (allocation for research, etc.).

A distinction must be made between products which have been manufactured before ("comparable" products) and products which are manufactured for the first time and for which there is no basis of comparison ("incomparable" products). Planned reduction of cost applies only to goods which have been produced in previous years. The share of comparable products in the total industrial production amounts to about 90 percent; however, in some branches of industry, particularly in the machine-building, chemical, and metallurgical industries, this percentage is considerably lower. In branches of machine-building industry, for example, comparable production amounts to only 50-60 percent. Consequently, it is important to determine accurately the proportion of incomparable production in order not to reduce the area where the plan of cost reduction applies.

The cost of incomparable goods must be determined on the basis of technological processes and technical norms.

The plan of reducing cost must take into consideration shifts in the assortment, as well as regional shifts of production. Cost of production is calculated in current prices. Therefore, it is essential in computing the cost-reduction plan to take into consideration any changes which occurred in the cost of raw materials, fuel, electricity, and other factors which enter production.

Checking the Progress of the Production Plan

Checking the progress of the production plan is the most important part of the work of the planning organizations. The aim is to establish whether the progress of the plan is in accordance with the stated tasks and indexes; to provide the necessary prerequisites for the fulfillment of the plan; to eliminate difficulties and prevent disproportions in carrying out the various phases of the plan; to establish the causes for plan nonfulfillment as well as the factors making for exceeding the plan; to determine the necessary corrections to the plans of individual branches of industry; to study the experience of the leading Stakhanovites and to extend the use of the best production methods; and, finally, to determine the kind of measures which must be taken in future planning.

The means of checking the progress of plan fulfillment are the data of national economic accounting organizations and data of individual enterprises and branches of industry, information in the Soviet press, periodic inspection, and personal contacts with enterprises.

All enterprises furnish the statistical organizations with periodic accounting data on the progress of the plan. These data are prepared for every day, every 10 days, monthly, quarterly, and yearly.

The most important source of information on the work of an enterprise is the yearly report and balance sheet of the enterprise. In addition to current accounting, periodic records are made by the accounting organizations which are much more detailed than the indexes of the plan. The most important records are the registers of industrial enterprises, which list such information as the number of enterprises, their organizational and administrative affiliation, the number of workers, capacity of power machinery, value of fixed assets; inventory of equipment, its capacity and age; and personnel records listing the number and composition of personnel. These registers are valuable because they contain detailed information on questions which cannot be included in current accounting.

In addition to the statistical material, the enterprise, trust, main administration and ministry prepare reports on the progress of plan fulfillment which analyze the operation of the particular plant or industry.

An indispensable part of the activities of personnel engaged in planning is continuous contact with enterprises.

Of importance also in checking the progress of plan fulfillment are the articles which appear in newspapers and periodicals and which deals with various aspects of the plan fulfillment.

It is important that control over the progress of the plan fulfillment be effective and constructive. It is not enough to find out which enterprises fulfilled or exceeded the plan or which did not fulfill it; it is necessary also to determine and study the reasons for these results. Secondly, in order that control be effective, measures must be taken to transmit the experiences of particular enterprises to other enterprises. These measures may relate to personnel, changes in supply, wages, or rates of productivity.

Nonfulfillment of the plan is not always the result of unsatisfactory operation of the enterprise, but may ensue from serious shortcomings of the plan itself. In cases where a branch of industry did not fulfill its plan over a long period of time the fault probably lies in the inadequacy of the plan, which did not take into consideration the actual possibilities of the branch of industry involved.

In checking plan fulfillment it is essential first of all to determine whether the accounting data agree with the planned targets. If monetary indexes of the plan are compared with accounting figures, it is necessary to determine first whether the prices are fixed prices of 1926/27, factory prices, or fixed prices of 1932. It is also necessary to know whether output is shown in gross or commodity output and whether the same method was used in working out the planned targets and the accounting data. A number of planning organizations show the method used in arriving at an index. This is especially important for indexes of Five-Year Plans, since in the course of 5 years the method and forms of computing individual indexes generally change.

The second phase of checking plan fulfillment is concerned with the assortment and nomenclature of production. By concentrating on production of goods requiring a smaller expenditure of labor and yielding higher profits, numerous enterprises find it easier to fulfill the plan insofar as cost of production is concerned. For example, a sewing factory has to make 100 shirts, 50 of which are silk shirts valued at 100 rubles each (making the total value 5,000 rubles) and 50 are cotton shirts valued at 20 rubles each (making a total value of 1,000 rubles). The total value therefore is 6,000 rubles. If the factory sews 70 silk shirts with a total value of 7,000 rubles and 30 cotton shirts with a value of 600 rubles, it will have fulfilled 126.6 percent of its production program without much effort, but to the detriment of the consumer.

Checking the fulfillment of the production plan is particularly important in cases where several plants collaborate to produce a finished product, as, for example, in the production of electrical equipment. Nonfulfillment of the plan in one of the collaborating enterprises will have serious repercussions on the other plants. It is therefore important to prevent disproportions in the production programs of the various enterprises.

The third task of planners is to determine the fulfillment of the production chart, i.e., the extent to which weekly, monthly, and quarterly production follows a uniform pattern. Some enterprises intensify output toward the end of a production period to make up for past slackness. This practice is harmful to the equipment, entails extra overtime pay, and leads to higher production costs. When this procedure is followed by several enterprises in a region, it taxes too heavily the requirements of electricity, fuel, materials, and transportation facilities, and inevitably leads to disturbances in the production schedule of related branches of the national economy.

Checking the progress of plan fulfillment is also the function of the accredited agents of Gosplan in oblasts and republics. These agents concentrate mostly on the commanding heights of industry in order to eliminate dislocations and bottlenecks.

Special attention must be paid to the plan fulfillment in the extracting branches of industry, in fuel and metallurgical industries, and in electric power plants.

It is also important that the planning organizations maintain close contact with leading workers, engineers, plant managers, party and trade-union workers, as well as with organizations of financial control, representatives of the Ministry of Finance, the State Bank, and other organizations.

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